TOBACCO GROWING
IN THE
CONNECTICUT RIVER VALLEY.

by

Leslie R. Smith

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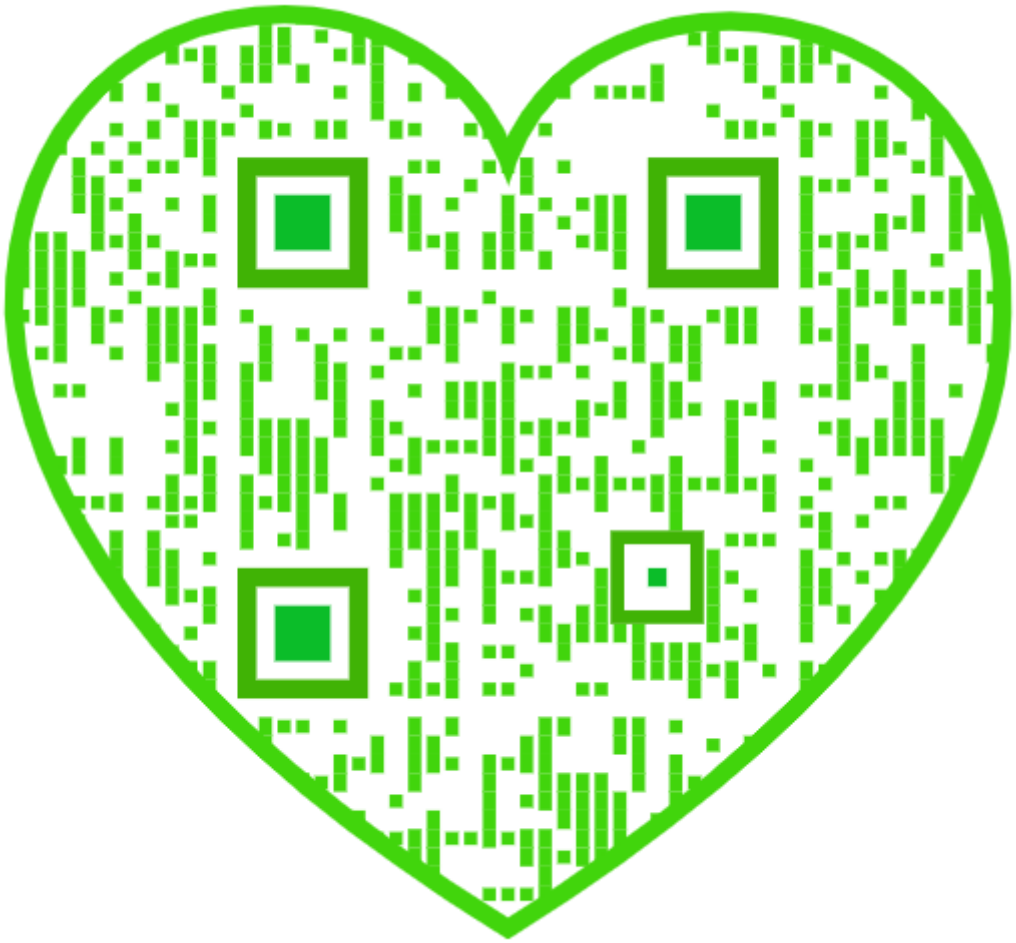

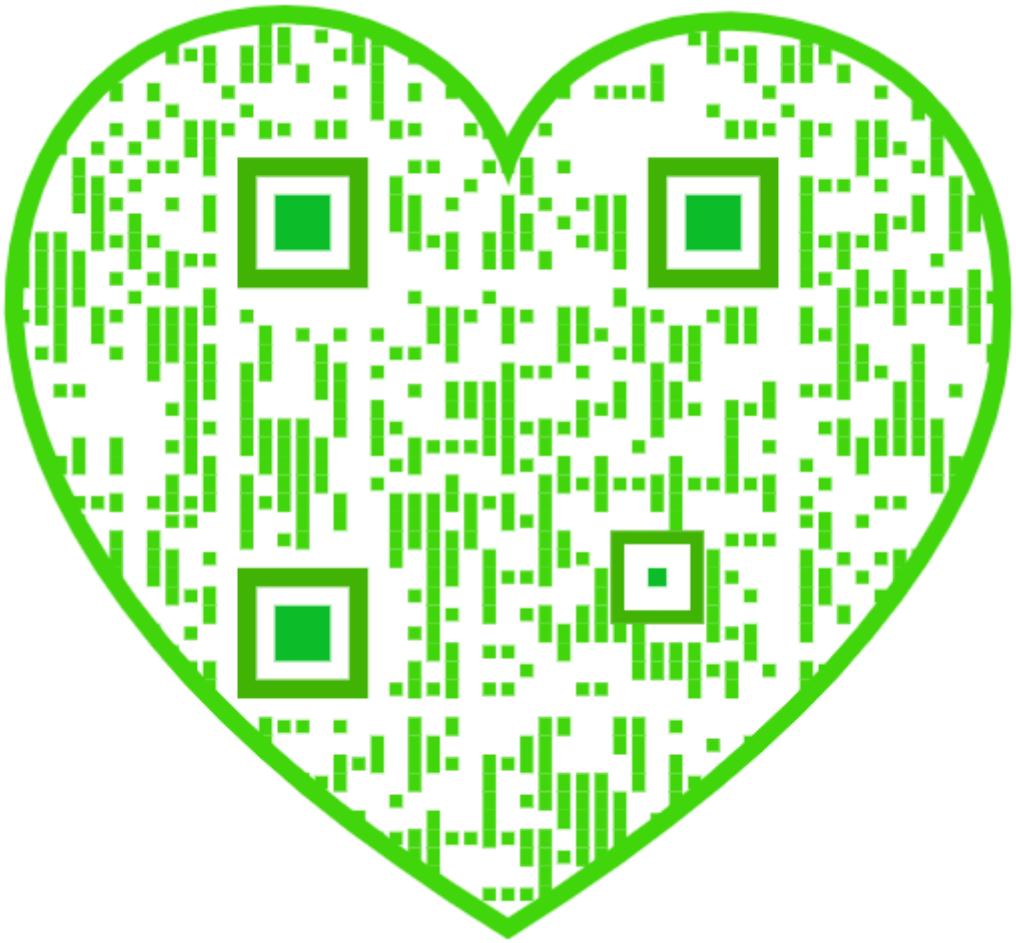

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TOBACCO GROWING

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LESLIE R. SMITH.

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INTRODUCTORY NOTE.

According to the latest census reports the Connecticut river towns in Massachusetts produce about a million and a half dollars worth of tobacco annually. As the last definite enumeration was the Federal Census of 1910, which reported the 1909 crop, these figures are now six years old. The increase since that year has been steady, and it is safe to say that the annual value of the crop in this State at present is not far from $2,000,000.

The tobacco towns of Massachusetts are entirely in Franklin, Hampshire and Hampden counties. By the latest available figures Hatfield is the banner tobacco town of the State, with a production valued at $301,-204; Hadley, second, $192,258; and then come Agawam, Whately, Deerfield, Southwick, Westfield and Sunderland in the order named. Hatfield alone has 17 tobacco storehouses, and 425 freight cars are needed to ship the tobacco crop from this one town.

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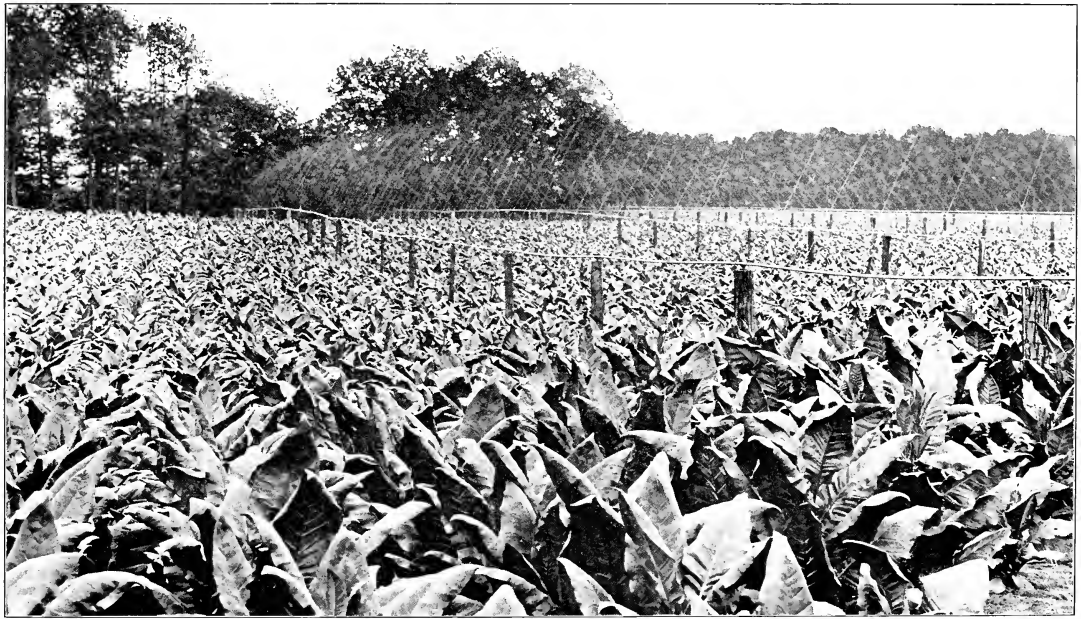


Irrigation system on tobacco field, Hatfield, Massachusetts.

TOBACCO GROWING IN THE CONNECTICUT RIVER VALLEY.

LESLIE R. SMITH, HADLEY, MASSACHUSETTS.

Tobacco has been grown in the Connecticut valley since about 1840, and while the crop has had its ups and downs it may be said to have steadily increased in acreage since that time. The past fifteen years have seen by far the greatest percentage of increase, and the end is not yet. Every grower is growing all the tobacco that he can hang in his curing sheds, and so new sheds are the very best indication of an increase in acreage. The increase of 1915 over the 1914 acreage was around 25 per cent. This crop is by far the most important money crop grown in this section, and represents extensive and intensive agriculture of the highest order.

The rapid increase of the past fifteen or twenty years may be explained by improved machinery, more abundant help, and, most important of all, the fact that in recent years the crop has brought prices that enable the grower to make expenses and have something left over for his labor and as a profit for his operations.

The successful tobacco grower is a specialist, as no crop grown calls for more scientific knowledge or the application of more common sense. In the growing, harvesting and curing of the crop the grower has to know something of practical chemistry, physics and biology.

But after all is said and done, the weather is the dominant factor. The history of the good or poor tobacco crop tells the story of the weather, — as in 1893 when the crop was largely a failure on account of drought, and in 1897 again a failure on account of excessive rain. Late frosts in the spring, early frost in the fall, the hail and windstorms, periods of excessive moisture or too dry weather at curing time, all show how the grower

must depend upon nature for his ultimate success. Indeed from the time the seed bed is sown until the end of the season the only time that the grower is sure of his success is when he gets the money for his crop. Yet he is optimistic; he "nurtures hope," he raises his crop, doing all he knows how, and if appearances count for anything he is getting along perhaps as well or better than the average business man.

There is no ironclad rule to be laid down for raising tobacco. The best growers often change their methods and are constantly on the lookout to learn of new ideas that will prove beneficial, so that the story of tobacco growing as told in this article will not attempt to tell of any best way, but will describe the methods as practiced by the most progressive growers.

The Seed Bed.

Tobacco is raised on the same land year after year. Most growers plow or harrow the land immediately after the harvest, thus avoiding a useless second crop of suckers that grow from the stump and remove a good deal of plant food from the soil. Many believe that if the field is kept fallow during the late fall and winter it will not attract the moth that lays the egg of the cutworm, a pest that is the cause of much trouble. The land is left fallow until the next year's crop is set out. This period is a convenient one in which to apply lime.

Each year finds the grower paying more and more attention to the seed bed, there being perhaps no one thing that gives him as much satisfaction in the spring as a good bed. Operations begin in the fall, the grower selecting a place for his bed sheltered from the cold north and west winds. Sometimes it may be necessary to build a board fence for this purpose. Many apply the fertilizer at this time and harrow it in. This is considered the better way if cottonseed meal is used, and some of the best growers say that there is nothing better. In the spring as soon as the ground is dry enough to work the beds are "made." This operation consists of fitting the land, putting up a frame and sowing the seed. Beds used to be covered with brush, but this material has been superseded by cloth and glass, glass being by far the better. The sash are 3 by 6, 3 by 9 or 3 by 11 feet, to suit the grower. These glass beds have enabled the grower of to-day to transplant or

"set" tobacco from three to four weeks earlier than from the brush-covered beds of years ago. In "making" the bed the land is made as fine as possible with harrows and rollers, and last with a hand rake. The seed is sown by some growers at the rate of one teaspoonful to the square rod; others sow one tablespoonful to the square rod. After being run through a cleaning machine to blow out the dirt and light seeds the clean seed is usually mixed with plaster, ashes or fertilizer so as to get an even stand. After sowing, the bed is either raked lightly, rolled with a hand roller or simply wet down with a hose; then the cloth or glass is put on. Some sow the seed dry, while others sprout it first.

There are two varieties of tobacco raised in the valley, — Havana seed and Seed Leaf or Broad Leaf. The former is by far the most common in the Massachusetts part of the valley, only a comparatively few raising the Broad Leaf.

After the plants are up every known method is used to force them. The bed may be sprinkled with manure water, or with water which has had ammonia added at the rate of one teaspoonful to the gallon, or water with nitrate of soda dissolved in it. Another method is to sow fertilizer before watering. Dry ground fish is a good material for this purpose as it does not injure the young plants and it is quickly available. Great care should be taken of the bed, especially a glass bed. Often a fine bed is ruined because the owner did not raise his sash on a hot day; again, lack of air also causes "damping off," a disease in which the plant decays just above ground. Sterilizing the ground with live steam in the fall or spring is growing in favor as this not only kills all fungous diseases, but the weed seeds as well. A large square pan of galvanized iron, boards or other material is inverted over the bed. This is pushed down into the soil, after which live steam is turned under the pan and held at a pressure of 80 pounds for half an hour, when the pan is moved to a new place. An objection to the wood box is that it becomes heavy after being soaked with steam. One pan made of galvanized iron 6 by 12 feet cost a grower $22. This grower claims that his beds were steamed at a cost of about $1 per square rod. He grows about 30 acres and started to steam his beds in the fall, but was compelled to give up the operation on account of freezing and finish in the

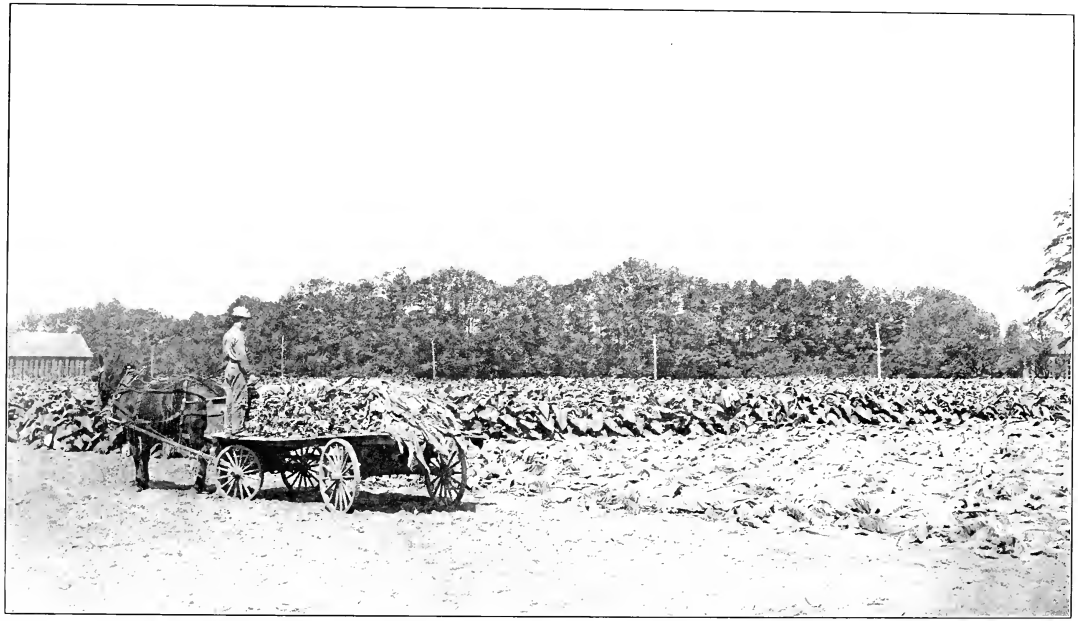
spring. This grower advocates steaming in the fall, as fuel is saved by the ground not being cold, and there is no frost to thaw out. Many growers claim that this steaming will pay for itself simply in the saving of weeds.

Fertilizing the Crop.

Materials used to fertilize the crop are barnyard manure, city stable manure, tobacco stalks, tobacco stems and commercial fertilizers of many kinds. Barnyard manure is not extensively used because it is not to be had. However, if used it should be plowed under either in the fall or spring. A great deal of city stable manure is bought. Tobacco stems are used to some extent, but the quantity is limited. Quite a number of growers are plowing under their tobacco stalks which have been found to contain from 6 to 8 per cent. potash. At a tobacco meeting held during the winter of 1915 one of the speakers asked how many growers present plowed under their stalks, and about one-half of those present replied in the affirmative. This well illustrates the attitude of the grower.

The bulk of the valley crop is raised on chemical fertilizer, and nearly every fertilizer company makes one or more special brands for this crop. Neither all the good nor all the poor tobacco is raised on one particular brand. Years of experience have taught the grower to be particular about the goods he uses. The materials must be quickly available as the crop must ripen in from sixty to eighty days from setting. The fertilizer also has considerable effect on those desirable qualities known as "body," "finish" and "burn." Cottonseed meal is the favorite source of nitrogen. Other ammoniates used are linseed meal, dry ground fish and castor pomace. Bone of some sort is well liked as the source of phosphoric acid, and sulphate is the favorite potash, muriate being tabooed on account of the chlorine contents which affect the "burn."

With a coat of manure 1 ton of fertilizer per acre will raise a good crop, but where manure is not available $1\frac{1}{2}$ to 2 tons of the high-grade goods are often used, the idea being to have enough plant food to insure a good growth. After the land is plowed, harrowed and rolled the fertilizer is applied broadcast. For this operation the fertilizer machine is invaluable, especially in windy weather. No time or expense should be



Cutting tobacco and hauling it to the curing shed, Hatfield, Massachusetts.

spared in properly fitting the tobacco land, filling in furrows, if there are any, and using the most efficient tools to pulverize and level the land.

Setting.

Transplanting or setting the plants generally begins about the 20th of May, and is the order of the day until the crop is well started, usually a month later. Setting is almost wholly done with a machine called the tobacco setter, and this is by far the most valuable machine used in the business. The old back-breaking method of hand setting has almost entirely disappeared from the valley. The setter needs plants that are a little larger than for hand setting, but does the ridging, setting, watering and marking for the next row at one operation. This machine requires three men and a pair of horses, and can easily set two acres in an afternoon, while in an all-day session three to five acres can be set, depending on conditions. Tobacco is usually set with the rows 3 feet apart, and the plants from 15 to 20 inches apart in the row. Plants that do not live should be reset at once by hand if an even stand is to be had.

Cultivation.

As soon as the plants have started cultivation begins. A favorite tool for the first time is a 12-tooth cultivator, which by careful handling will allow the operator to work close to the row, the machine being run twice in each row. If deep cultivation is to be practiced, the early part of the season is the time to do it, before the root system has developed. Hand hoeing is next in order, and from now on as long as a horse can travel between the rows the land should be stirred once a week or even oftener. Some growers hoe by hand three or four times in a season, while others use the horse hoe. Many different methods are used, but the principle is the same, namely, to keep the soil well stirred so as to retain moisture and to keep the plant growing all the time.

Topping and Suckering.

When the plant has grown large enough for the seed bud to appear, the top is broken off, or the plant is "topped," the idea being to throw the strength that would naturally go into

the small top leaves, blossom and seed into the larger leaves left on the stalk. These are usually from 18 to 22 in number. After the field is topped it presents a very even appearance. In a week or ten days after "topping" suckers will appear, starting from the base of the three or four top leaves. These are picked off, or the plant is "top suckered." After these top suckers are taken off the leaves further down the stalk will begin to throw out suckers, and these in turn must be picked off. Usually when the bottom suckers are grown or are big enough to take off the plant will be nearly or quite ripe and ready to harvest. This will be about three weeks from "topping." The crop should be allowed to get ripe, a condition which is shown by the plant having a slightly wilted appearance, especially on the bottom leaves. Light green blotches will also show all over the top leaves. There can be no doubt that some crops are cut too green, the result being a dark-colored crop that will not bring the best prices.

Harvesting.

There are three methods of harvesting in vogue in the valley to-day. The first two to be described have been in practice for years; the third is a new method that is gaining in favor each year. The first is "hanging on lath." The plants are cut close to the ground with a thin-bladed hatchet made for the purpose. They are then laid down lengthwise of the row and overlapping each other; after lying in the sun long enough to wilt they are picked up and handed to the "stringer" who strings them on a lath. These laths are similar to builders' laths, being sawed a little thicker and from better lumber. One end is placed in a "stringing horse" and the other end is fitted to a steel needle. The plant is then strung on the lath by forcing the needle through the butt of the stalk about 6 or 8 inches from the end, 5 or 6 plants being strung on a lath. The full lath is either laid on the ground and later picked up, or handed directly to a wagon fitted with a rack made for the purpose. It is then drawn to the curing shed and hung on poles, arranged so that each end of the lath rests on a pole, allowing the tobacco to hang downward. Poles are usually 15 feet long and from 25 to 30 laths are hung on a

Priming shade-grown tobacco.

pole. They begin at the top of the shed and are hung tier after tier until the shed is full, the tiers being usually 5 feet high.

"Hanging on string" is another well-known method of harvesting, and many growers favor it above all others. The plants are cut as before, only they are laid crossways of the row, and after being allowed to wilt are loaded directly onto low wagons, the butts laid all one way. The plants are then drawn into the shed where they are hung on poles with tobacco twine. The hanger carries a bag on his back which holds a ball of twine. With this he hangs the plants about 8 inches apart on the poles by tying a half hitch around each plant. When the pole is full the twine is tied around the last plant, broken off and the next pole started.

Priming.

This new method of harvesting tobacco came with the shade-grown tobacco, and has found favor among many growers who grow the outside or sun-grown tobacco. The barn has to be rigged differently, with the tiers only half as far apart as either of the methods previously described. The plant is not cut, but the leaves are picked off or "primed," as they ripen, four or five at a time, beginning with the bottom one. The pickers sit down between the two rows and "prime" both rows, placing the leaves in little piles. These are picked up by another man and placed in baskets and are drawn to the end of the row on a hand truck, loaded onto a wagon, and taken to the shed where the leaves are strung. Generally women and children do this work, using large needles and stringing forty leaves on a string, which has been knotted at one end. After the leaves are all on, the stringer knots the other end of the string and hangs it on a lath which has been notched at either end. These laths are then hung up tier upon tier as aforesaid. In a few days the second priming is taken and so on until the crop is harvested. Cases have been known where the first priming has become cured and taken down before the last priming was taken, thus giving a chance to use the shed a second time in the same season. When the crop is to be primed it is not necessary to top the plant. After the priming is finished the

stalks are cut down and utilized in different ways; some growers run them through a cutting machine and plow them under or use them for top-dressing grass.

Curing.

The curing shed is really the factor limiting the increase of tobacco acreage. It is useless for the grower to set more plants than he has shed room to take care of. To hang an acre of tobacco requires a shed 30 by 30 feet. A building this size will cost from $300 up, depending upon whether it is of frame or of pole construction. The pole shed is built by setting the posts in the ground and is not framed, the braces being nailed on. This type of shed is by far the most common. The frame shed is built so that every third board is a door for ventilating purposes.

With the crop in the barn the grower has to watch it closely, opening the ventilating doors on some days and closing them on others; at all times there should be a man near at hand to note the changes in the weather and to act accordingly. With tons of water in the crop which must evaporate in a few weeks this is an anxious time for the grower. Too much moisture will retard evaporation; then, too, there is danger of "pole sweat," while a dry season with the doors open all the time will dry and not cure the crop.

Taking Down.

With the crop cured the next step is to take it down. The tobacco has now changed from a heavy green leaf to a light thin brown, and is so dry that it will crumble if grasped by the hand. To get the crop down whole, therefore, it has to be handled at a damp time, when the leaf is said to be in "case" or, more commonly, "in good shape." "As soft as a kid glove" is an expression often used in describing this condition. When this warm, damp spell comes, no matter if in the middle of the night or on Sunday, the grower gets very busy with all the help he can command and takes down all he can handle. With the lath method the laths are simply slipped off the pole, and with a man on each tier are handed very carefully and quickly to the floor. There the tobacco is pulled off the lath and piled with the butts laid both ways, making a pile about

6 feet wide and as high as the weather will allow. Early in the fall the pile cannot be made as high as later, because the stalks are green and there is more danger of the pile heating.

When hung on string a man at each end of the pole pushes the tobacco into a bunch in the middle of the pole. One man with a sharp knife then cuts the string, the other man handing the bundle to the man lower down, when it is piled as before. With the primed tobacco it is simply slipped off the string and placed at once into a bundle. After the pile is made it must be at once covered so as to retain the moisture. Different materials are used for this purpose, such as damp cornstalks, paper, cloth, etc. From now on the crop must be kept damp, and the shed should be shut as tight as possible to keep out the wind.

Stripping.

As soon as possible after the tobacco is taken down "stripping" begins. With the hands on either side of the pile a section is uncovered, each plant is taken up, and the leaves rapidly picked off or "stripped" one at a time. The stripper begins at the butt, and when finished piles the stumps behind him. The leaves are placed in the stripping boxes which are of different sizes, 36 inches long and 12 inches square being about the average. The box is made with three sides and the ends tight, with saw calves on the side for the string. First the string is placed in the box, then paper of the right size. After the box is full the paper is brought over the top, the string is tied and the bundle taken out of the box. The bundles are piled up from three to five high and the crop is then ready for delivery. The grower has to deliver the crop to the place agreed upon at time of sale, either to a warehouse or a railroad station. Some of the crops are bought in the field before they are harvested, but the majority of the tobacco is sold, and nearly all is delivered to the sorting shops in the bundle. The sorting, packing and sweating is done by the dealer in most cases, and there are the best of reasons for this, as from twenty to thirty varieties are made from the crop and one single grower would have only a little of each variety.

The sorting shop of to-day is a good example of specializing. Here the dealer will grade and pack to suit his trade, making light, medium and dark wrappers, with three to five sizes of

each; binders, top leaves and fillers, with different sizes of each. These different grades are packed into boxes $2\frac{1}{2}$ feet square and of different lengths. From 300 to 375 pounds are packed and pressed into a case, which usually goes directly to the sweatroom. This sweating process used to be done in nature's good time, and was accomplished during the hot summer months, the tobacco being dry and ready for market in the fall. Now, however, the crop is forced to sweat by placing it in a steam-heated room with the thermometer at 130 degrees. In about thirty days the operation is complete, and the goods are ready for market. The sorting shops employ a great deal of help during the winter and pay good wages. They usually open about November 1 and run well into April, closing in time to let their men out for outdoor work.

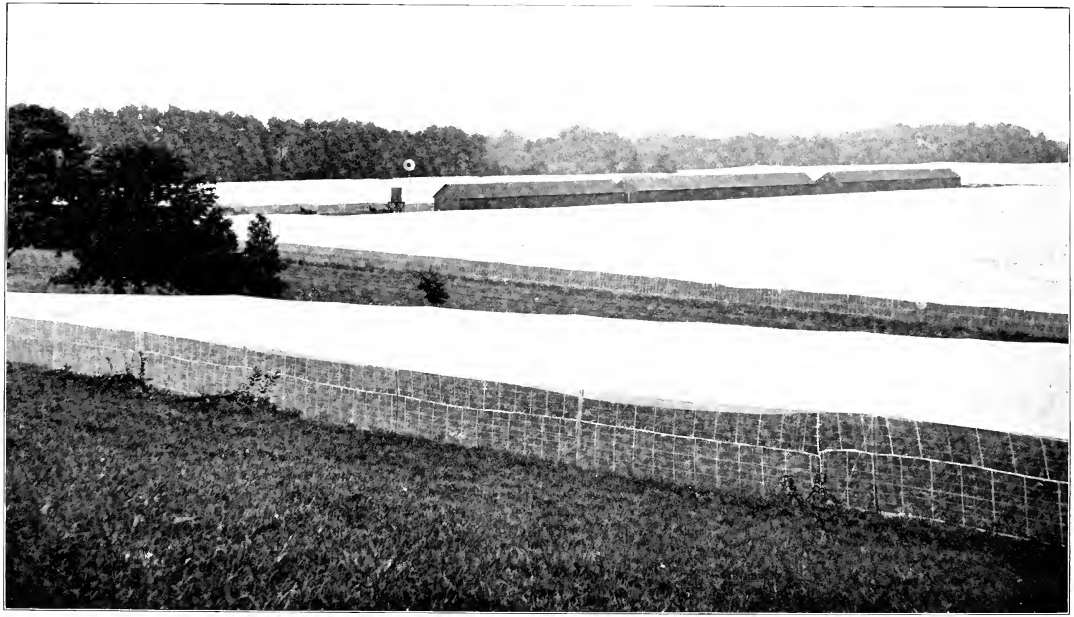
Shade-grown Tobacco.

This article would not be complete without describing in a measure the latest thing in growing tobacco in the valley. To get a cigar wrapper that would possess the qualities of the domestic leaf and yet be thin enough to compete with the goods grown in the tropics the experiment of growing tobacco under shade was tried first in 1900. To-day this process seems to have passed the experimental stage and has evidently come to stay. Many growers are growing from 20 to 50 acres under cloth, while the larger corporations are growing from 100 to 300 acres.

The entire field is set with posts with wire strung across the top. This framework is then covered with cheesecloth, making a vast tent. The plants are set as before described, then the sides are covered so that the cloth reaches to the ground. This tent tobacco is not topped, and often the blossoms will reach the cloth 9 feet from the ground. The tobacco is cultivated by the same methods as outside tobacco, and is harvested by the priming method.

Enemies.

The first real trouble with tobacco is the fungus in the seed bed, and the steaming process already described is the remedy, in the opinion of many growers.



A field of shade-grown tobacco, showing curing sheds in background.

Cutworm.

Immediately after the plants are set the cutworm begins to operate and is at times a serious enemy, not only causing a lot of resetting, but, what is worse, causing an uneven crop of tobacco that will not ripe evenly. A good remedy is a poisoned mash made by mixing a pound of Paris green with a hundred pounds of bran; this should be sweetened lightly with cheap molasses, using water enough to make a stiff paste, and a very little should be dropped beside each plant. This may be done by hand at no great trouble or expense, or by a machine made for the purpose and attached to the setter. Another way is to mix 1 pound of Paris green with 50 pounds of red dog flour, sifting a little on each plant. This is done with a home-made sifter and is not an expensive operation.

Wireworms.

Sometimes, and especially in a cold, wet season the wire-worm causes considerable trouble for the tobacco growers. While the plant is small the worm will bore directly into the heart of the stalk, and the plant will have the appearance of being alive, yet will be dying all the time. The only remedy is late plowing which not only kills the worm but will destroy many of its egg cells.

Horn Worm.

Early in July there will appear on the tobacco plant a small green worm hatched from an egg about the size of the head of a pin. This egg is laid by a moth that flies only at nightfall. The worm will grow as large as a man's finger, and as it grows will eat more and more ravenously. One worm will often spoil two or three plants. Hand picking is the only remedy practiced in the valley.

Grasshopper.

The ordinary grasshopper will cause trouble occasionally, especially if the field is next to a grass lot. After the grass is cut, if the weather is dry and the rowen crop does not readily start, the hopper will eat the leaves of the plant next to the grass full of little round holes. Some growers protect their field by planting two or three rows of corn between the tobacco and the grass.

Hail and Wind.

The elements mean real trouble for the grower, as hail and wind may quickly ruin his crop. Insurance is possible at a cost of $7.50 per acre. A policy of $150 per acre for a total loss will about pay for the cost of the crop.

Early Frost.

The remedy for this is to have the crop under cover before the frost comes.

Pole Sweat.

Pole sweat is caused by a spell of damp, warm weather during curing time, when the atmosphere is so damp that evaporation cannot take place. It may be controlled by the use of charcoal fires built in the shed, either in holes dug in the dirt floor or in small furnaces made for the purpose.

These are a few of the troubles that keep the tobacco grower guessing the whole season long. Other problems will only be settled as time brings the answer. One question that is causing much discussion is the supply of humus. Without manure there is a danger of the soil being without vegetable humus, and as a result it packs down too hard and does not retain moisture as it should. Some growers are using a cover crop, sown as soon as the tobacco crop is harvested and plowed under early in the spring. This plan is being tried out more and more, the claim being made that not only does the cover crop supply a certain amount of humus, but that it also keeps the soil from washing and blowing during the late fall and winter months. Barley, vetch and rye are the crops usually sown.

Just a few last words on the subject of "handling." The idea of tobacco growing is to make money. In order to get the best price for his goods the grower must raise good tobacco. He must handle it right after he has raised it. Many a crop is spoiled in harvesting. The leaves should be kept free from holes, sunburn, bruises, etc., all of which can be avoided by proper handling. The grower is mistaken when he thinks he can save money by using boy or cheap help, as a slovenly, careless man may easily spoil more tobacco in a day than he is worth. The dealer will many times buy tobacco before it is

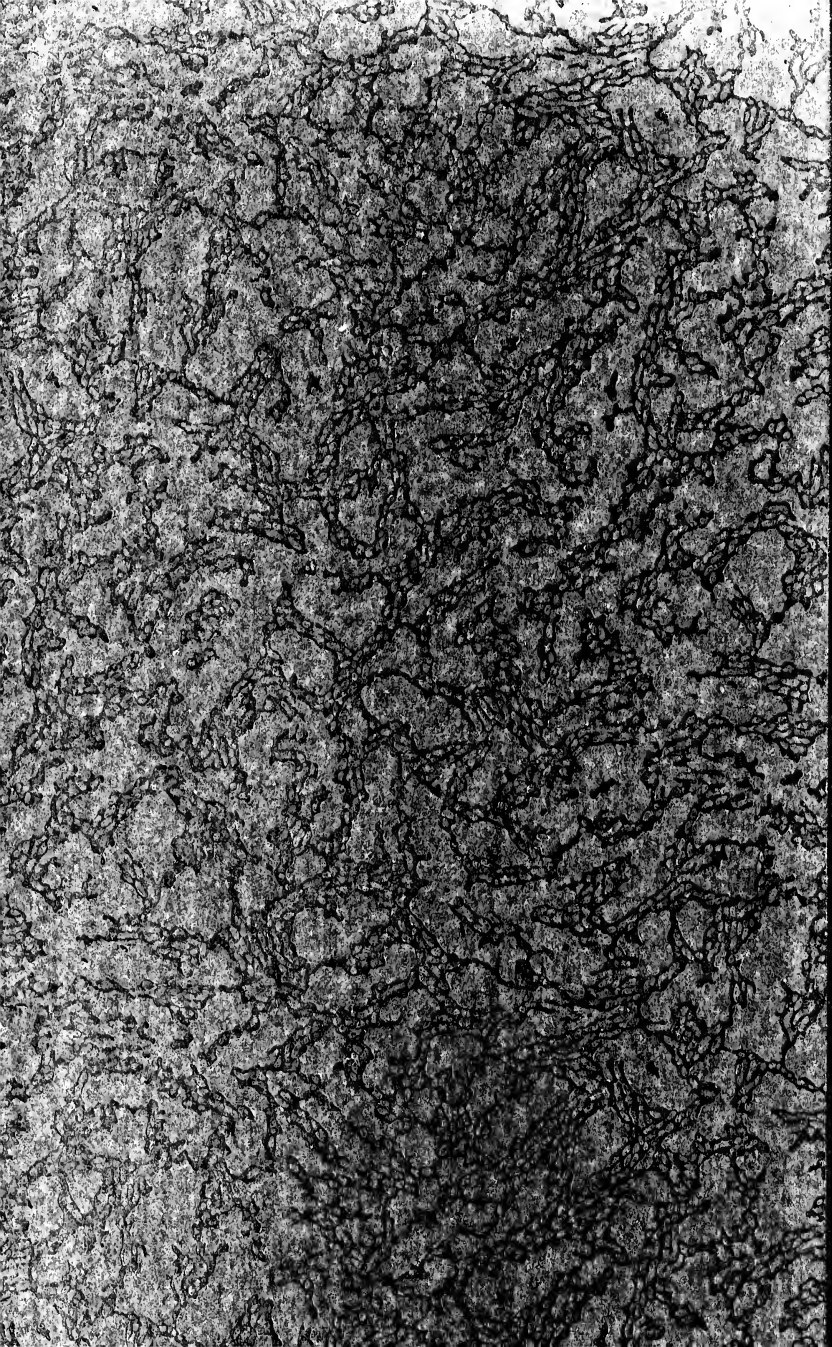
harvested if he knows that the grower is a good handler and that he will put up his crop right. Another grower gets the name of being a "hog handler," as it is called. Dealers say that he handles his tobacco just as he does his cornstalks; thus, as in other things, it is true of tobacco raising that "whatever is worth doing at all is worth doing well."

Estimate of Cost of raising One Acre of Tobacco.

Rent of land (including use of shed),	$50
Labor (including raising plants),	70
Fertilizer,	50 to $80
If bed is steamed,	2
Paper and twine,	2
	$174 to $204

Estimate of yield for past five years,	1,500 pounds
Estimate of price for past five years,	15 cents

This is the average, but it is true that many growers get from 1,700 to 2,000 per acre and from 15 to 20 cents per pound.

Cost of Shade-grown Tobacco.

According to the figures obtainable it costs around 45 cents per pound to raise shade-grown, and it has been sold at 90 cents per pound. The yield per acre has been around 1,400 pounds.